ABSTRACT

The present invention provides methods for enhanced detection of biological response patterns. In one embodiment of the invention, genes are grouped into basis genesets according to the co-regulation of their expression. Expression of individual genes within a geneset is indicated with a single gene expression value for the geneset by a projection process. The expression values of genesets, rather than the expression of individual genes, are then used as the basis for comparison and detection of biological response with greatly enhanced sensitivity. In another embodiment of the invention, biological responses are grouped according to the similarity of their biological profile.

The methods of the invention have many useful applications, particularly in the fields of drug development and discovery. For example, the methods of the invention may be used to compare biological responses with greatly enhanced sensitivity. The biological responses that may be compared according to these methods include responses to single perturbations, such as a biological response to a mutation or temperature change, as well as graded perturbations such as titration with a particular drug. The methods are also useful to identify cellular constituents, particularly genes, associated with a particular type of biological response. Further, the methods may also be used to identify perturbations, such as novel drugs or mutations, which effect one or more particular genesets. The methods may still further be used to remove experimental artifacts in biological response data.